DOWNLOAD PDF IP CCTV SYSTEM DESIGN

Chapter 1 : CCTV Design Software - VideoCAD Professional

â€¢ A design checklist to help the physical security and network manager achieve the goal of integrating IP video surveillance on the IP network. â€¢ A case study for implementing IP video surveillance on a campus deployment.

Focal Length measured in mm â€” The distance from the center of a lens to the focal point sensor. The longer the lens focal length, the narrower is the angle of view. If you need to calculate the CCTV focal length, you should specify the following parameters: Distance from Camera â€” maximum distance from Camera to the target. Camera Installation Height â€” Security camera installation height. Height â€” Height of the target for example 1. Width â€” The other option is to specify FOV width instead of the height. Just enter the desired width of Field of view viewing area for the specified camera distance. The other option is to specify viewing angles instead of FOV Width. You can choose the sensor format from: Usually, you can find the sensor format in the camera specification. Megapixel cameras often use following sensor formats: Pixel density values at distances where these test people are located are shown in the status bar of the program. The user can click on the drawing to see the pixel density at the cursor position. Resolution â€” Camera resolution in pixels. You can select resolution from the drop-down list. Compression â€” Video compression. If you use low MJPEG compression level 10 you get best quality of picture and about 10 times lower frame size. With a JPEG level more than 50 your picture became bad for video surveillance purpose. Typical FPS for video surveillance system is from 5 to 15 frames per second. Days â€” Required length of video archive in days 24 hours. Used for storage space calculation. This parameter is used to calculate disk storage space in case the video is recorded on a schedule or on a motion detector. As a result for each camera type you get: Frame Size Kilobytes - software can make frame size estimation based on resolution and compression. In some special cases you can measure your real frame size and specify it in this field. Bandwidth, Megabits per second â€” How much network traffic is required for these cameras. Disk Space, Gigabytes â€” Disk storage space required to store video archive. At the bottom of the window you can find total bandwidth and disk space required for your video surveillance system. To make proper bandwidth planning you should know practical the bandwidth values for your network type. Bandwidth and storage space are calculated using following formulas:

Chapter 2 : IP Video System Design Tool

IP CCTV System Design - JVSG Empower & educate your staff on CCTV System Design! Our course is end to end, covering, bandwidth & storage calculations, networking & storage considerations as well as head-end/server requirements!

Calculations Calculating geometric parameters of camera view area in any camera position. Calculating size of the active area of the image sensor in dependence of the aspect ratio of the image sensor and the aspect ratio of the output image of the camera. Calculate the horizontal projection sizes of person detection , identification and license plate reading areas. Calculate the image size on display of any object in camera view area in percentage of display size, pixels and millimetres or inches in case of Imperial format. Calculate depth of field of each camera in project. Calculate the length and electric parameters of cables. Calculate light power and illumination produced by illuminators with photometric accuracy, including discharge lamps with complex spectrum and infrared LED illuminators. Working with 2D projections Choose visually a relative location of cameras using the graphics window with CAD interface. Display on the 2D layout results of calculations: Display by separate colors and hatch styles different regions of spatial resolution and field-of-view size. There are prepared spatial resolution patterns according to the following criteria: Calculate the horizontal projection of camera control areas including shadows from obstacles on the scene. Choose the best positions and calculate control areas of PTZ cameras , Dome cameras and degree cameras. Modeling camera rotation around the main optical axis. Modeling influence of the lens distortion on view area shape, on view area projection shape and spatial resolution distribution. Correct modeling wide-angle lenses with strong distortion. With the help of the window you can observe the layout in 3D representation. You can work on the project in usual 2D projections and watch it in 3D. You can "walk" on the floors of 3D models of buildings and study every detail. Free cutting 3D layout by six planes to provide access to any point of complex 3D buildings. Working with multilevel 3D layouts and terrains with complicated vertical structure. Possibility of loading prepared 3D models a person, a car, etc. You can add your own 3D models from Autodesk 3ds Max and Sketchup. Possibility of using 3D models-territories , to place inside them cameras, constructions and other 3D models. Modeling images from cameras based on camera parameters and scene conditions Model observed scene parameters illumination, visibility limitations. Model luminaires with photometric accuracy considering spectrum of radiation and spectral sensitivity of image sensors, including discharge lamps with complex spectrum and infrared LED illuminators. Model lens parameters focal length, aperture, auto iris DC and Video Drive, resolution. Visually control modeled resolution with the help of the Test chart. Model images from megapixel cameras with number of pixels exceeds Windows screen number of pixels Up to megapixel and more! Calculate and model in 3D depth of field of each camera in project. Model brightness , contrast, compression, horizontal and vertical sharpness. Model blur and distortion of moving 3D models depending on camera parameters exposure time, interlacing, rolling shutter. Modeling images taking into account lens distortion barrel and pincushion. Obtain Image Model for each camera in the project based on models of scene and equipment. This image can be printed and saved. Design operator interface using the Monitor window. Modeling resolution of monitors. Create animated monitor models as html files with moving 3D models and separate frame rates of each camera.

Chapter 3 : Professional design of CCTV system

Networked Surveillance System Design Guide Choosing Network Cameras 6 Indoor Indoor cameras are relatively less affected by ambient conditions, compared to outdoor cameras.

Estimating person identification areas and license plate reading areas causes additional difficulties for a designer. The task becomes more complicated when it is necessary to choose optimal relative positions of several cameras or when it is necessary to make one camera solve several tasks for example identification of entering people and surveillance over the perimeter. You can also add the necessity to calculate how this or that object will be displayed, where the motion detector will detect a person for an instance with enough light and contrast ratio, and where it will not. Not only lens focal length but also the height of the camera installation, maximum distance and the height of surveillance have an influence on the screen image. If we also remember obstacles that distort the viewing areas and dead space under the camera, then we can see the difficulty of the problem. The more difficult the task is the more likely that a mistake will occur. The result of which at best can be a project cost increase. These tasks can be solved in different ways. Someone accurately calculates the viewing areas for several heights and lens focal length of each camera using self deducted formulas or formulas taken from guide books and then transfers or combines obtained templates. Someone makes the calculation easier and having introduced reserves gets approximate results with the help of a Lens calculator. Someone draws on the plans only the horizontal angles from lens specifications thus confusing himself and the customer even more. And many people ignore such calculations because of their complexity and labour-intensiveness and place wide-angle lenses or the most expensive ones from the price list of the producer. Wide-angle lenses very often they remain the same even after acceptance of work as a rule satisfy the needs of a customer only up to the first emergency. After an emergency it comes out that there is practically no use for the installed CCTV system. Criminal is not identified, license plate is not read out, motion detector did not detect any movement. It becomes obvious that there should be more cameras, their locations should be different and lenses should have other focal lengths. The situation looks different if professionally well executed CCTV projects participate in a tender. Using a professional CCTV project it is possible to discuss with a customer a task for each camera, and to choose and substantiate the necessary number. After doing the calculations more video cameras may not be needed as one camera can fulfill several tasks. Such solutions are more time consuming but create effective and at the same time economical projects. After each discussion and transference and when camera parameters change one has to recalculate and compare several variants of cameras placement. Thus professional designing of a television system is a very difficult task that demands much time. Not all customers understand this and they give preference not to the best project, but to the one that was quickly rendered or to the cheapest one. All dependences of camera viewing areas obey the laws of geometrical optics and can be described mathematically. Widely spread are Lens Calculators that can be used on many security web sites on-line. They can be in the form of small programs or a plastic circle. Viewing areas are viewed as a rule in the two-dimensional aspect which allows the use of relatively easy calculations. The most convenient is the plastic circle which can be easily used in field conditions. This makes calculation of person identification areas and license plate reading areas out of the question. Moving to a three dimension coordinate system the complexity of calculations increases many times, and it is practically impossible to find a good three-dimensional free calculator. But it is still inconvenient to work with a specialized three-dimensional calculator especially when it is necessary to calculate several connected video cameras. One has to simultaneously use a program-calculator and CAD program, that locates video cameras on the plan, while recalculating and redrawing viewing areas projections in order to get the necessary result. The next step is the integration of a three-dimension calculator and CAD program. The calculator acquires a graphical interface and its calculation results are presented in graphic form. Obtained graphical calculation results are represented directly on the plan of an object in horizontal and vertical projections. Graphical interface that allows locating video cameras by one mouse click, to raise or lower a video camera only by one turn of a mouse wheel, change its angle of inclination and lens focal length and see

the result there and then, makes CCTV systems designing easy and exciting work. These and very many other ideas are realized in full measure in a new program intended for CCTV systems designing. This program is called VideoCAD. The latest version of VideoCAD 5. Specialized calculations of video surveillance viewing areas, person identification areas, license reading-out areas, detailed representation of objects in different parts of a viewing area, calculation of length and electrical parameters of cables are tightly integrated with traditional CAD interface. Examining an object, discussing and formulating the list of tasks stated before the CCTV system. Getting of an object plan better in electronic version, but also acceptable on paper. Object plan drawn on paper can be scanned and used in VideoCAD as a background for cameras location. Direct on the background with the help of VideoCAD one can create preliminary camera locations. During the next visit on the object preliminary cameras location is corrected taking into account possible camera locations, light, different obstacles, possibilities of cables lay out, etc. Corrections of location are simple and convenient in VideoCAD. All necessary actions are conducted with several mouse clicks. With the help of VideoCAD length and necessary parameters of coaxial and power cables can be calculated. File containing text with detailed descriptions of all video cameras and cables is produced. On basis of obtained location with marked viewing areas and also with the help of the text file a business proposal is made. Business proposal is sent to the customer for discussion and concordance. During the discussion camera tasks and their locations are specified after which with joint efforts requirements specification is made. While making requirements specification one can also use the text file. Especially efficient is the discussion of a project in front of the computer, as then it is easy to choose and total the required number of cameras. It is obvious that after such a dialog a competent customer will hardly move to a competitor. In the process of designing all that is left, if necessary, is to draw out the planning in VideoCAD, to make specifications, explanatory notes, estimate calculations, etc. Your professional project is ready! In the project everything they need will be mentioned; lens focal length, place and height of each camera, viewing area. An installer will only need to turn the camera in order to get the designated project viewing area. While accepting the CCTV system, the customer makes sure that all viewing areas agree with those marked in the project. After estimating the quality of image and installation work, he signs acceptance report. After having accepted the system, all changes to viewing areas should be charged extra. Of course the real sequence of actions can differ, but in general one can see, that the process of designing a CCTV system is getting clearer for both the designer and the customer. The most important is the result one gets; an efficient CCTV system that fulfills its functions in full measure. Who knows how many crimes can be prevented and uncovered with the help of it. With VideoCAD you can: Choose the most suitable lenses, heights and locations for camera installation to provide the required parameters of view areas, detect and identify a person, read license plates and obtain an object image of required size on the screen using the known actual sizes and location of the object. Choose visually a relative location of cameras using the graphics window with CAD interface. Calculate the horizontal projection sizes of viewing, person detecting, identifying and license plate reading areas to draw them on the object plan. Measure the view area distortions, arising from natural obstacles. Construct three dimensional models of real scenes with the possibility of loading prepared 3D models a person, a car, etc. Obtain a model of a real image from each video camera. This image can be printed and saved. Model quality parameters of a video image resolution, compression, coloration, smoothing, contrast, brightness. Calculate the image size on the screen of any object in camera view area in the percentage of screen size, pixels, TV lines and millimeters inches in case of Imperial format. Model multiscreen monitors and design operator interface using the Monitors window. Obtain a drawing containing two projections of object layout with the camera images, calculated view areas and cables, and with coordinate grid and titles to be pasted into graphical path of the project. Print out the obtained drawing on one or several pages. It is possible to use prepared frames with standard overlay Title-Block and logo. Export the obtained drawing into any of the following formats: Calculate the Depth-of-field of each camera in the project. Obtain a text file with full description of all the cameras in the project, view areas and cables to be pasted into a project explanatory note or used as an instruction for installation. Study the influence of the criteria of person detection, identification and license plate reading on the sizes and location of the correspondent areas by changing the criteria according to the video image quality.

DOWNLOAD PDF IP CCTV SYSTEM DESIGN

Study the principles of object representation in different view area parts using the test object and the graphics window. Calculate the length and electric parameters of cables. Reduce the time expended and boost the design quality. Cut down the amount of controversial situations with customers and accelerate their solution. All the calculations are real-time allowing to view the influence of each parameter specified upon the final result. VideoCAD does not use any simplified formulas and techniques, in non-typical situations giving out considerable errors. VideoCAD operates with any correct parameters, both selected from the list or typed. VideoCAD can be used for the prompt, but exact calculations of the view area projections to draw on a location plan when performing a graphical part of project. It can be also used to perform a view area scrupulous analysis to choose the most suitable camera location and lens parameters. Despite its reach of opportunities VideoCAD is an inexpensive program, available even for the general public.

Chapter 4 : Free CCTV Software & Surveillance Tools

IP Video System Design Tool includes a field of view calculator, lens focal length, CCTV storage and bandwidth calculators, pixel density and resolution calculator and many other CCTV tools so you can design a video surveillance system quickly, easily and professionally.

Chapter 5 : Camera Design Tool with Google Maps Integration

IP CCTV design is a constantly developing arena. It demands the designer and installer look closely at the main concerns from customers of running an IP-surveillance system on their organisation's network.

Chapter 6 : IP Camera Systems for complete IP security solution

IP CCTV network surveillance systems. Vision is an expert in the design and installation of IP CCTV calendrierdelascience.com fact, our reputation for installing IP surveillance systems across the UK and Europe means your security is in the best hands.

Chapter 7 : IP Video Design Tool - How to use - CCTV Design

Advanced CCTV and what it means to Features and Benefits of IP/Digital systems Design concerns of IP/Digital systems CCTV - The Basics of a CCTV System.

Chapter 8 : JVSG: CCTV Design Software

About Cisco Validated Design (CVD) Program The CVD program consists of systems and solutions designed, te sted, and documented to facilitate faster, more reliable, and more predictable customer deployments.